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ABSTRACT

When the State Council of Higher Education for Virginia (SCHEV) released its 2000-2010 projections of student demand for Virginia higher education, many were stunned at the projection of as many as 38,000 new students looking for access to higher education, but policy makers formulated, and state voters passed, a general obligation bond package to help meet this demand. SCHEV later contracted with analysts to validate the original enrollment model and produce a new forecast. This report contains the revised projections. The results are no less stunning than the original; there are indeed more students seeking a place in Virginia higher education. The original model underperformed for two reasons. It did not take into account the business cycle and the relative economic boom of 1999-2000, and it relied heavily on the retention/progression data for a single year, which proved to be the lowest in years. The updates forecast now projects 60,879 additional students for the period 2000-2010. Nearly 35% of those students have already been enrolled as of fall 2002. Overall, there is a growing gap in the 4-year sector between supply and demand, and in the 2-year sector, the problem may be much more severe. The report makes suggestions to solve the enrollment gaps, but to fund the expected growth between 2003 and 2010 would cost an estimated $125 million annually. It is not likely that the formula-driven funding needs will be met, but several institutions have identified innovative approaches to handle growth. Appended is a 30-page report prepared by Chmura Economics & Analytics for the State Council of Higher Education for Virginia entitled "Validation to Demand Results for SCHEV Report 'Systemwide Needs Assessment for Virginia Higher Education: 2001' and Revised Demand Forecast." (Contains 22 figures.) (SLD)

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Revised Enrollment Demand Projections through 2010 and Potential Gaps in Higher Education Services

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July 16, 2003

SCHEV

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Executive Summary

When the State Council of Higher Education for Virginia (SCHEV) released its 2000-2010 projections of student demand for Virginia higher education in March 2001, many in the Commonwealth were stunned that there would be as many as 38,000 new students looking for access to higher education. It was on the strength of this number and its resulting implications that sufficient political will was rallied to put together a general obligation bond (GOB) package to go before the voters to build nearly a billion dollars worth of new facilities and renovate existing facilities. It is fortunate that this effort was successful and the 2002 GOB package was indeed passed by the voters because the revised projections suggest demand even greater than originally forecasted.

SCHEV's initial demand projections in 2001 were used in concert with enrollment targets by the four-year public institutions and Richard Bland College (by agreement, the Virginia Community College System (VCCS) does not produce enrollment targets). This resulted in a bottom-line understanding that there were more students coming and not enough places for them to be served, thus legislation for the general obligation bond and its subsequent passage. Two years later, in 2003, in pursuing its biennial requirement to develop enrollment projections for the system (pursuant to the *Code of Virginia*), SCHEV revisited the demand forecast, as it appeared that the institutions had already taken a significant amount of the students likely to come.

To this end, SCHEV contracted with Chmura Economics & Analytics (CEA) to validate the original model and produce a new forecast. The results are no less stunning than the original forecast of student demand: there are indeed more students seeking a place in Virginia higher education. Essentially, the original model under-performed for two main reasons, both of which were closely tied together. First, the original model did not take into account the business cycle. The years 1999-2000 were years of relative economic boom with high employment levels, even for those individuals without an undergraduate degree or advanced degree. The recession was officially declared in November 2001, after SCHEV completed its projections in March 2001. The original projection heavily weighted 1999-00 data, as it was the last actual data available when the original forecast was completed. Second, rates of student retention and progression are significant drivers of the demand model as they describe those students whose demand is currently being met. The original model, developed in 2001, relied heavily on one year's retention/progression

rates, those of 1999-2000 (fall headcount to fall headcount), which, most likely the result of the business cycle, were the lowest in years. In other words, retention was low in 1999-2000 as employment was plentiful; students had more employment options during an economic boom period than they have available to them during recessionary periods and thus students left college for work at a greater rate than previously. The revised projections correct for the effects of the business cycle by averaging the retention rate over time.

As can be seen in Figure 1, the updated forecast now projects 60,879 additional students for the period 2000-2010 as compared to SCHEV's 2001 forecast of 38,000. (Details of the model validation study and updated forecast can be found in Appendix A.) A key difference in the revised forecast is that it focuses on forecasting demand by Virginia residents and by student level, unlike the original forecast, which looked at enrollment in total. Combined with the institutional enrollment targets, the Commonwealth is in a better position to plan for this growth than ever before.

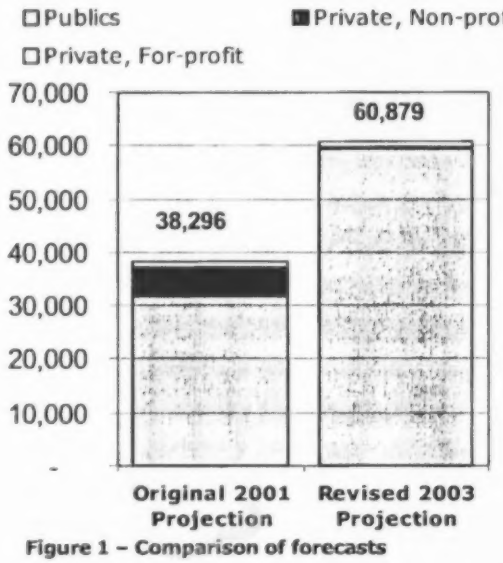


Figure 1 – Comparison of forecasts

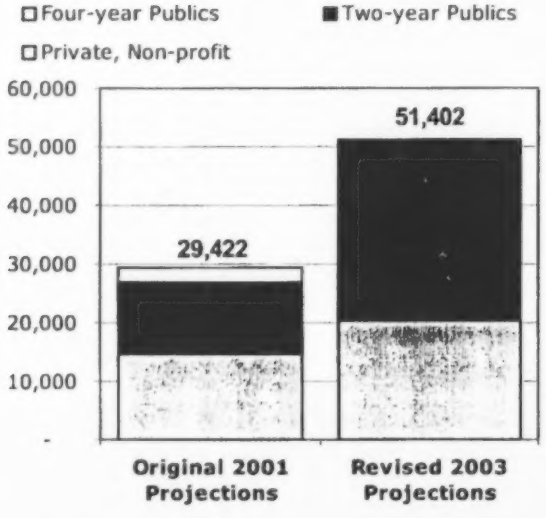


Figure 2 - Growth by sector of Virginia residents.

Figure 2 shows the differences between the revised forecast of demand by Virginia resident students to derived values from the original 2001 forecast. Growth in public higher education is expected to be 51,246 students between Fall 2000 and Fall 2010. Clearly, the forecast for two-year public institutions (the Virginia Community College System and Richard Bland College) is profoundly different from the original. The revised forecast projects growth nearly three

times that of the original forecast (31,006 vs. 12,013). Growth in the private, non-profit sector is projected to be flat at a total of 156 in-state students vs. the original projection of approximately 2,502 students.

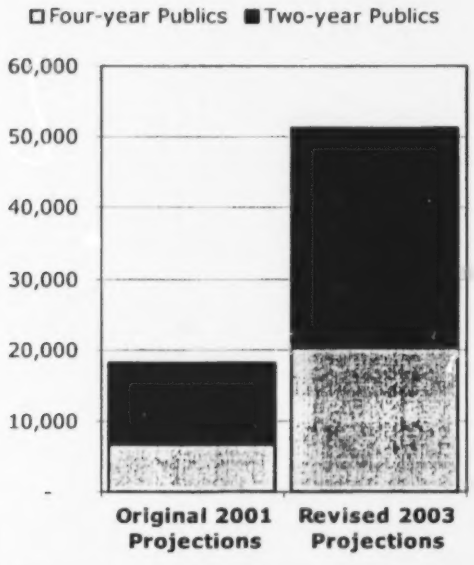


Figure 3: Actual growth thru 2002 compared to revised projection for 2010 of in-state students.

The next graph, Figure 3, demonstrates how much of the growth has already occurred. Of the 51,246 students forecasted by 2010 (an increase of some 22,000 students over the 2001 forecast) nearly 35% of those students have already been enrolled in the public sector as of Fall 2002. In detail, the four-year public institutions have taken 6,660 in-state students of a projected 20,240 in-state students, leaving an additional 13,580 yet to be enrolled between 2003-2010. Similarly, the two-year institutions have taken 11,342 in-state students of a projected 31,006 in-state students, leaving and additional 19,664 yet to be enrolled between 2003-10.

In February 2003, SCHEV began the process of working with the public four-year institutions and Richard Bland College to produce a set of consensual enrollment targets to serve as the official enrollment planning figures that the *Code of Virginia* biennially requires. Through a series of institutional meetings and with assumptions of minimal funding for growth and slower than desired completion of the new capital projects in the general obligation bond, institutional "worst case scenario" targets were developed. Despite these guidelines, as well as the simple fact the institutions are already stressed from the growth that has occurred in the last five years and especially in the last two, the public system will still experience planned overall growth in the system. Much of this growth is the result of increasing rates of retention and progression, as well as modest growth in the numbers of new students to which certain institutions are willing to commit.

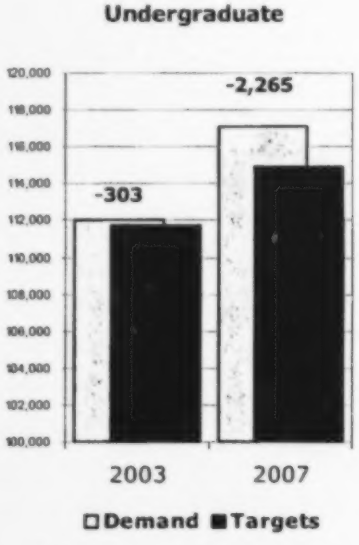


Figure 4: Difference (Gap) between forecast demand and institutional targets, in-state undergraduates.

In-state undergraduate enrollment demand is expected to exceed supply (the institutional targets – the number of seats available) by 303 students in the fall of 2003 and 2,265 students by the fall of 2007, as depicted in Figure 4. Much of this gap between undergraduate demand and supply, can likely be attributed to demand by Virginia resident high school graduates. Comparisons of projections of high school graduates (by NCES and SCHEV) to the estimates of Virginia residents enrolling as first-time freshmen as provided by the public four-year institutions indicate a coming gap of 1,100 to 1,600 students in Fall 2007.

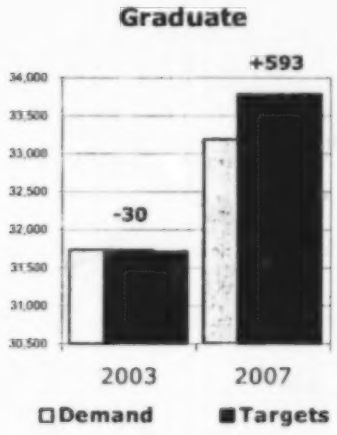


Figure 5: Difference (Gap) between forecast demand and institutional targets, in-state graduate students.

Figure 5 shows that there is a gap in demand of 30 gradate students in Fall 2003. However, by Fall 2007, institutional enrollment targets exceed forecasted demand by 593 students. For first professional students (Figure 6) a marginal over-supply of students in 2003 and a demand of 158 students in excess of stated supply by the institutions are depicted. However, typically first professional programs have limited flexibility in increasing or decreasing their programmatic enrollments.

Overall, there is a growing gap in the four-year sector between supply and demand. Even if the institutions can continue to grow at their current rates, demand will likely continue to outpace supply. By 2010, the gap will likely be between 4,200 and 6,200 in-state students, most of whom are likely to be in-state undergraduate students (Figure 7).

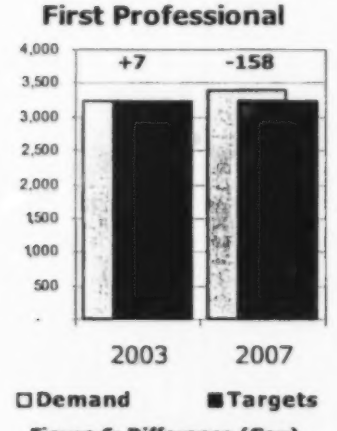


Figure 6: Difference (Gap) between forecast demand and institutional targets, in-state first professional students.

In the two-year sector, the problem may be much more severe. Using data provided by the VCCS based on annual full-time equivalent enrollments (FTE) for academic year 2001-02, there is a current space deficit equal to 8,901 FTE students. (Because the VCCS does not do enrollment projections, we have to rely on data regarding physical capacity to determine estimates of supply.) When adjusted for the approved capital projects under the GOB, another 13,492 FTE can be accommodated above the 2001-02 enrollment level, leaving a "surplus" of 5,401 FTE. Assuming a multiplier of 2.2 fall students per FTE, this translates into a rough estimate of 11,881 students over the Fall 2001

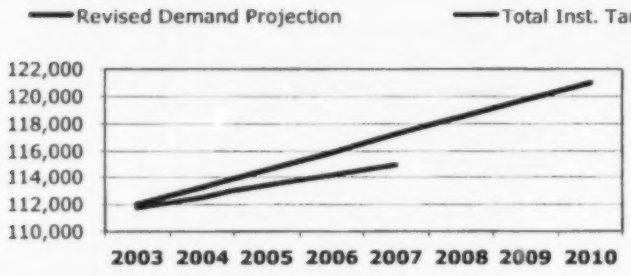


Figure 7: Revised demand projection vs. institutional enrollment totals, in-state undergraduate students only, public four-year

headcount, about half of which were already accounted for between Fall 2001 and Fall 2002. Further, these physical capacity estimates are aggregate. Since the population projections suggest that much of this enrollment growth will be along the urban corridor (Northern Virginia, Hampton Roads, and Richmond), space deficits in the Hampton Roads and Northern Virginia areas are especially of concern. Admittedly, these are rough estimates of physical capacity and say nothing about teaching capacity (having a faculty member in the classroom and other educational resources). However, since early estimates of base budget adequacy suggest an operating budget shortfall of more than $125 million annually and that the VCCS is spending nearly $1,000 less per student than it did a decade ago in inflation adjusted dollars, operating capacity, when coupled with space deficit issues suggest additional enrollment at the community colleges will stress an already stressed system and will more than certainly compromise quality of instruction.

An additional issue to be addressed is that the VCCS expects as many as 3,000 of these new students will be entering with the expectation to later transfer to a four-year institution, whether public or private. The projected targets for the public four-years indicate they are planning to increase Virginia resident transfers by fewer than 600 students, leaving a gap of approximately 2,400 transfer students.

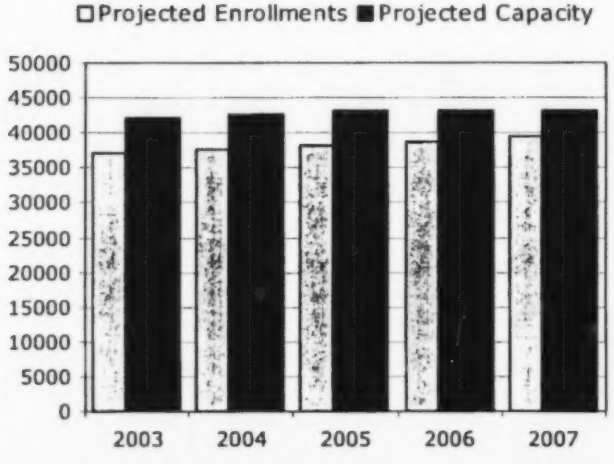


Figure 8: Private institutions projections of enrollment and capacity

In surveying the private, nonprofit, four-year institutions, with 20 of them responding thus far, there appears to be capacity at the private colleges to address a portion of the increase in

demand. In Fall 2007, there appears to be 3,746 seats capacity available, primarily for undergraduates. Also, there appears to be 2,972-3,224 seats available for undergraduate transfer students, as part of their total enrollment. These spaces represent an opportunity to serve Virginians if the public institutions are unable to accommodate more or such an option proves more cost effective.

Finally, contained in the report are a variety of approaches to solving the enrollment gaps. The majority of the public four-year institutions, during their individual institutional meetings, indicated a willingness to grow, but only if such growth was properly funded. Some institutions face significant problems in growth. They lack physical space, or have little ability to attract adjunct and part-time faculty because of their location, or are simply operating with significant funding deficits making growth nearly impossible without a diminution of services.

To fully fund the expected growth between 2003 and 2010 would cost an estimated $125 million dollars annually based on the state's funding formula. This is in addition to the under-funding of $350 million that currently exists. As a result of the current economic conditions, it is unlikely that the formula-driven funding needs will be met. However, several institutions have identified innovative approaches to handle growth. SCHEV is working to develop solutions (in concert with the affected institutions) to address the issues that inhibit growth and prepare a budget and legislative package, that can accomplish these ends, for consideration by the Governor and General Assembly in the fall of this year.

In summary, the findings of the report are:

- The enrollment base has already increased by 18,000 students; another 33,000 increase to the base is projected.
- As much as half of the undergraduate growth in the four-year institutions may not be served by the end of the decade.
- Significant demand will be in the already-overstressed VCCS.
- Northern Virginia Community College and Tidewater Community College, those with largest existing space deficits, are the VCCS colleges most likely to be affected.
- There appears to be insufficient space for transfers at the public four-year institutions.
- There appears to be capacity in the private institutions to address some of the growth.
- With additional resources many public institutions are willing to grow.

Introduction

At the SCHEV Council meeting on May 22, 2001, the Council approved the projected enrollment targets of the public four-year public colleges and Richard Bland College. These targets indicated a planned growth from 177,009 to 187,310 students between Fall 2000 and Fall 2005. The net increase of 10,301 students would have represented 5.8% above the Fall 2000 enrollment. The anticipated enrollment for Fall 2002 was a total of 179,885 students under these targets, or an increase of 4,144 students.

On July 17, 2001, SCHEV announced its forecast of an increase of 38,296 students in systemwide demand of for Virginia higher education between Fall 2000 and Fall 2010. This forecast was based on a newly developed demographic projection model looking at population growth by age and locality and became a core piece of the 2002 Systemwide Needs Assessment for Higher Education, linking that forecast to the physical capacity of Virginia's institutions. This forecast came during the height of the business cycle when the financial outlook was relatively good. The public four-year institutions had spent the spring admitting students for Fall 2001 unsuspecting of the events of September 11, 2001 that arguably triggered the recession that was only first acknowledged in November of that year.

As was explored in SCHEV's report Enrollment Trends at Virginia's Public Colleges and Universities, released in March 2003, public enrollments grew substantially between 2000 and 2002. To wit, total fall headcount enrollment at the public four-year public colleges was 185,981 students – 6,134 students more than the enrollment targets of the institutions, and 7,717 students above the projected demand of 178,264. The two-year sector also grew – by 13,282 students to a total of 151,321 students. Clearly, significant unplanned growth took place over the two-year period.

The release of the SCHEV report The Condition of Higher Education Funding in Virginia on May 21, 2003 highlights the financial stress of a growing system. Higher education's share of the state's general fund continues to shrink. In FY89, higher education made up 18% of the state's general fund budget but in FY04, it will be about 12%. Over the past 15 years, total educational and general appropriations increased 17% after adjusting for inflation. However, total support per student actually decreased, on average, indicating that institutions used available resources to accommodate enrollment increases – more than 60,000 over the last 15 years, nearly 24,000 in the last two years alone – and had

fewer resources available to address quality improvements and new initiatives and programs.

Despite the fact that Virginia experienced similar economic difficulties as other states and the nation, the Commonwealth's public colleges and universities continue to lag behind their peers in the amount of state support and total funds spent per student. Virginia institutions receive, and thus spend, less per student than do their peers. Further, Virginia colleges and universities are currently under funded relative to the state's funding model by more than $350 million a year.

In exploring the forecast for the coming years, keep in mind how much Virginia's public institutions have grown over just the last two years. The new students the institutions accepted, and later enrolled, in a boom economy were still there when the recession occurred and when state support was reduced to the colleges. Many of those students are still there, and will still be there as new students enter the system further stressing an already stressed system.

Description of Processes

The Code of Virginia (§ 23-9.6:1.4) requires SCHEV to review and approve or disapprove the enrollment projections (technically these are actually "enrollment targets," which is how they will be referred to in this report) proposed by each public institution of higher education. The Council undertakes this activity each biennium prior to the "long" session of the General Assembly. The goals for this activity are to understand the six-year enrollment objectives of Virginia's colleges and universities; and to assist SCHEV, the Governor, and the legislative money committees to plan for future budget needs. In the past, SCHEV, in consultation with the Department of Planning and Budget, would prepare a demographic projection for this same period and SCHEV would then determine if the aggregate targets are reasonable given the demographic projection.

Furthermore, as part of the its four-year planning cycle, the Council released a set of projections for the demand of higher education in the Commonwealth for the decade. This widely used forecast predicted a demand of approximately 32,000 new students expected by the end of the current decade in public higher education. Since SCHEV is preparing for its biennial budget development processes and typically revises enrollment projections each biennium and because the original 2001 forecast of 2000-2010 enrollment demand relied on outdated data (e.g. 1990 Census data and 1999 population data) and, finally, because we know that enrollment grew more than the original demand projection (actual

Fall 2001 and 2002 enrollments), a reforecast is necessitated. SCHEV's goal for this re-forecast process is two-fold. First, as required by the *Code of Virginia*, SCHEV has engaged in its biennial collection of enrollment targets from the public four-year institutions and Richard Bland College to develop an enrollment-planning figure for higher education funding recommendations. Parallel with this effort, SCHEV staff has been collecting similar targets from the private, non-profit colleges. Second, SCHEV worked with a consultant to develop a new set of demand projections to provide a complete picture of the likely demand for higher education services in Virginia, by Virginia residents, for the remainder of the decade.

On April 29, 2003, SCHEV staff met with members of its ad hoc steering committee on enrollment to reflect on the enrollment meetings and implications moving forward. Staff members from the Senate Finance and House Appropriations Committees, the Department of Planning and Budget, Secretary of Education's office and SCHEV are represented on this ad hoc committee. By and large, the group felt the institutional meetings had gone well. All were concerned that some of the institutions had used different assumptions in the preparation of their enrollment supply projections. The very strong consensus was that SCHEV should require certain institutions to resubmit their projections under the assumption of no new funding as was provided in the instructions. This was done and the affected institutions resubmitted their enrollment targets by the requested date.

Statement of Demand Projections

Overall

By their very nature, projections are really no more than mere guesses or estimates about the future, usually based on knowledge about the past. Some projections are more or less sophisticated than others; some focus more on greater levels of detail than others. The differences between the demand projections of 2001 and 2003 come down to simple changes in assumptions and different choices about data regarding the past to inform the future. Through this report, specific numbers are referred to suggesting a level of precision that is unrealistic. The reader is cautioned to treat this precision as simply an artifact of the mathematics used, and not as a precise target expected to be met.

Too often when enrollment projections, targets, or demand is discussed, the focus is on enrollment of only in-state undergraduates, and generally, first-time freshmen. The concerns are actually much broader in scope than that. First, there is significant demand from out-of-state students for space in Virginia's public institutions. This report does not deal with that group as it is assumed that the individual institutions will enroll as many out-of-state students as befits the mission of each institution, within the limits established by the General Assembly. In the Act of Appropriation, item 136 E3 (page 129) states: "In determining tuition and fee charges, the boards of visitors or other governing bodies of institutions of higher education shall...(b) not increase the current proportion of nonresident undergraduate students if the institution's nonresident undergraduate enrolment exceeds 25 percent." Subparagraph 5 then goes on to exempt NSU, VMI and VSU from this provision. Excluding these students we are left with five groups with which we are concerned:

1. Freshmen. The largest single group of new students, now accounting for over 20,000 in-state students. Typically we think of these students as being right out of high school and thus their enrollment in college corresponds consistently with high school graduations. However, each year across the Commonwealth some 500-1000 (two to five percent) new freshmen at the public four-year colleges have not recently graduated high school and are often much older than 17-19 years of age. This is especially true in the VCCS.

2. Transfers. Typically the total count of new students at the public four-year institutions who have transferred from another institution is around 9,500 students. Somewhat less than half of these come from the VCCS, and only one quarter of those students transfer with associate degrees.

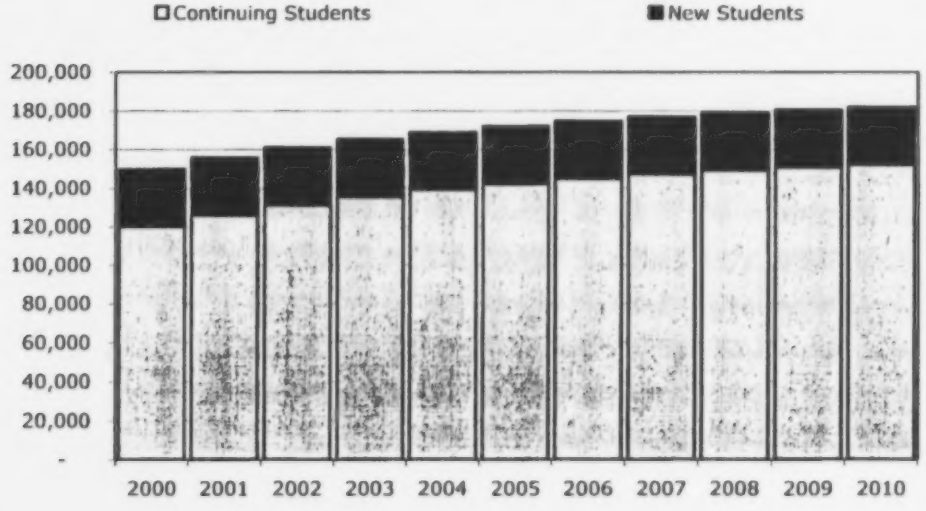
3. Graduate students. Each year some 5,000 new Virginia-resident graduate students at both the masters' and doctoral levels enroll at the public four-year institutions.

4. First Professional students. Not only is this group small, typically less than 850 Virginia residents, it is very stable in size and growth is restricted based on the very structured program sizes and capacities. These programs consist of law, medicine, veterinary science, dentistry, and pharmacy.

5. Unclassified students, both undergraduate and graduate. 7,000 – 8,000 students enroll for the first time each year in an unclassified status at the public four-year institutions. Some of these students are institutional employees taking one or

more classes, others are adults there for many different reasons, such as gaining a specific credit, taking courses of personal interest, or to academically earn their way into a program at another institution, or just trying to decide if college is for them.

Finally, before discussing the forecast itself, it should be clarified what is meant by demand. Total demand is the total number of students seeking higher education services; it is not just the number of new students such services. Mathematically, it is the number of continuing students each year plus the likely number of new students to seek services. As long as the number of new students entering the system (receiving services) is greater than the number lost each year and annual retention rates remain relatively constant, then overall demand will continue to increase. The chart below demonstrates this using sample data.



Revised Forecast of Overall Demand

The original SCHEV Demand Projection Methodology developed in 2001 relied on projections of the number of new students likely to enter the institutional sector (public or private); the number of students likely to graduate or leave the sector each year (inverse retention/progression analysis); and the base number of students in the prior year. The retention/progression analysis was performed using SCHEV's data warehouse working with data at the individual student-record level. The projections of new students likely to enter the system were based on population growth rates from the 1990 U.S. Census and Census Series A State Population Projections disaggregated by age groups and the five high-level categories of race/ethnicity. These growth rates are then applied across ten student levels by age group within those student levels and racial/ethnic group. The retention/progression analysis was performed using retention data from Fall 1999 to Fall 2000, the most recent available at the time.

The results of this forecast were a total of 38,296 new students between 2000 and 2010, based on fall headcount enrollment. This number represented all students, both in-state and out-of-state, at all levels, and was disaggregated only to the sectors of attendance: public four-year institutions (18,899); two-year publics (12,712); private, non-profit four-year institutions (5,568); and private, for-profit four-year institutions (1,117). By Fall 2002, it was clear that actual fall enrollments had already far exceeded the projections, both of demand and the enrollment targets developed by SCHEV and the institutions in 2001. Further, with the absence of projections by student level, it was impossible to determine what problems in enrollment capacity truly lay ahead. Because of the recent surge in enrollment, the availability of more current data, and SCHEV's statutory responsibility to revise enrollment projections biennially, SCHEV revised its demand projections for the period through 2010.

Appendix A contains the report by Chmura Economics & Analytics (CEA) with whom SCHEV contracted to aid in the development of a revised enrollment demand projection. In its revised projections, SCHEV determined that the projection would have the most utility if it focused on projecting in-state enrollment by student-level (undergraduate, first professional and graduate) for the public four-year and two-year institutions, and private-nonprofit institutions rather than total enrollments by sector. For-profit four-year institutions were left out of the revised projections because of a lack of consistent and sufficient student-specific data. As a result, the original projections of an increase of 1,117 students in that sector are assumed to hold true.

The model used in the revised forecast differs little from the original SCHEV model save that considerations of race/ethnicity are excluded; the age groups used are somewhat simplified, and the retention/progression rates are modified. In performing the validation of the original model used, CEA determined the reasons for the model's under-performance were two-fold: 1) there was no consideration of business cycles, in a year when the economy was exceptionally strong in growth and job production, particularly as that was the base-year for the model; and 2) the 1999-2000 fall-to-fall retention/progression rate used to drive the model was the lowest rate in years, due also to the business cycle mentioned previously (which can have profound impacts on the forecast given that CEA determined that a one percent change in retention/progression represents 15,190 students in 2010). Given that the model is actually driven in large part by retention, these were significant reasons for the understatement in the original projection.

The revised population and census data proved to have little impact on the results of the model. In fact, population and census updates alone would have reduced the original projection by 10,000 students. Hence, clearly indicating that retention rates and the impact of the business cycle played a larger role in explaining the differences in the two projections (original 2001 v. revised 2003 forecasts) than did population projections. In reviewing the forecast numbers in the table below, it is critical to keep two things in mind. First, the model assumes that demand was met in Fall 2002, in other words, that all students seeking entrance into the system found a seat. Second, if indeed demand *exceeded* supply for 2002, then these forecasts are understated as there are still un-served students seeking access to higher education.

Overall, the revised forecast projects 60,879 new students compared to the original 2001 forecast of 38,296. Of the new forecast total, a net increase of 51,402 in-state students is projected, of which 20,240 are likely to seek enrollment at the four-year public institutions, 31,006 at the two-year public institutions, and 156 at the private, non-profit institutions. This is a substantial increase over the original 2001 demand forecast. The numbers are broken down by sector and year in the tables below, which come from tables five and six respectively of the CEA report (appendix A).

Total In-State Fall Headcount Enrollment (Projections)

	4-year Publics				2-Year Publics	All Publics
	Undergraduates	Graduates	First Professional	Total	Total	Total
2000	105,651	29,710	3,236	138,597	131,273	269,870
2001	107,862	30,731	3,229	141,822	138,158	279,980
2002	110,693	31,361	3,203	145,257	142,615	287,872
2003	112,009	31,734	3,241	146,984	145,613	292,597
2004	113,306	32,101	3,279	148,686	148,378	297,064
2005	114,592	32,466	3,316	150,374	150,959	301,333
2006	115,873	32,829	3,353	152,055	153,398	305,453
2007	117,155	33,192	3,390	153,737	155,725	309,462
2008	118,442	33,556	3,427	155,425	157,967	313,392
2009	119,736	33,923	3,465	157,124	160,146	317,270
2010	121,042	34,293	3,502	158,837	162,279	321,116
Δ 00-10	15,391	4,583	266	20,240	31,006	51,246
% change 00-10	14.57%	15.43%	8.23%	14.60%	23.62%	18.99%
Δ 02-10	10,349	2,932	299	13,580	19,664	33,244
% change 02-10	9.35%	9.35%	9.35%	9.35%	13.79%	11.55%

Total In-State Fall Headcount Enrollment (Projections)

4-year Private Non-Profits

	Undergraduates	Graduates	First Professional	Total
2000	19,663	2,778	1,288	23,729
2001	18,906	2,195	1,071	22,172
2002	18,260	2,728	882	21,870
2003	18,475	2,746	889	22,109
2004	18,692	2,764	896	22,352
2005	18,913	2,783	903	22,598
2006	19,136	2,802	910	22,848
2007	19,362	2,822	917	23,102
2008	19,591	2,843	924	23,359
2009	19,824	2,864	932	23,620
2010	20,059	2,886	939	23,885
Δ 00-10	396	108	-349	156
% change 00-10	2.01%	3.90%	-27.07%	0.66%
Δ 02-10	1,799	158	57	2,015
% change 02-10	9.85%	5.80%	6.50%	9.21%

To place these forecasts in the context of what has already occurred, of the 51,246 in-state student demand increase at the public institutions between 2000 and 2010, 40% of those students are already enrolled. During the period between 2000 and 2002,the four-

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year institutions enrolled an additional 6,660 students and the two-year institutions enrolled 11,342 for a total 18,002 students that were already enrolled.

Projections of Rising High School student demand

The National Center for Education Statistics (NCES) projects a 14.2% increase in Virginia public high school graduates between 1999-2000 and 2006-07, for a total increase of 13,374 students. Through 2011-12 this increase is projected to be 23.5% to a total of 81,030, up from a base of 65,596. According to these projections, academic years 2008-09 and 2009-10 will be the peak years with numbers of graduates around 82,600 and the following years representing a slight decrease and leveling of enrollment. These trends are demonstrated in Figure 9.

These numbers coincide closely with projections by SCHEV staff using the public school membership projections provided by the Weldon-Cooper Center for Public Service. The table below compares these projections with the NCES projections. SCHEV used two slightly different models to project high school graduation (with either standard, advanced diplomas, or GED) based on actual or project fall membership. Both models rely on data from the Virginia Department of Education (VDOE) from the annual fall membership and graduation reports. The first model uses a standard graduation rate based on the number of graduates divided by the number of freshmen four-years previous. Unlike college graduation rates, this is not a cohort model where only students originally in the freshman class of a secondary school can be counted as graduates toward the graduation rate, instead it is a raw ratio with no consideration of consistent membership. The second model is also a raw comparison, but it is of graduates against the fall membership of the

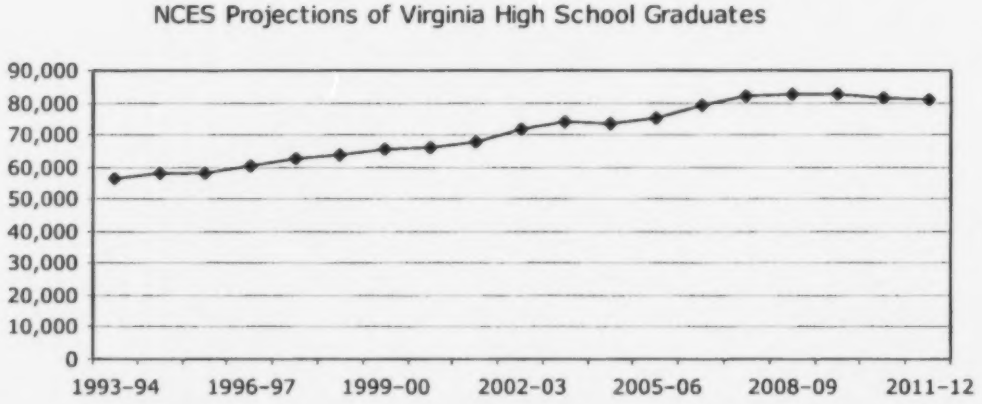

Figure 9: Projections of Virginia High School Graduates, data source: National Center of Education Statistics, Projections of Education Statistics to 2012, Table 25.

senior class, thus there is likely to be much less variance between the groups i.e. fewer students entering and subsequently graduating that were not reported in the fall. The other differences are that in the first model we used the average graduation rate of the preceding years and in the second model, we used the most recent rate, which is somewhat higher than the average, but lower than the highest years.

However, the most significant problem with both models is that neither is informed by the use of the Standards of Learning as a barrier test to graduation. At this writing, there is insufficient data to know if graduation rates are going to be significantly different than the past. It will be critical to observe the changes in graduation patterns and adjust the models accordingly.

	Actual Graduates			Projected High School Graduates				
	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08
Model 1	66,310	67,940	70,988	73,514	75,144	75,985	78,753	81,205
Model 2	66,310	67,940	72,963	73,555	75,154	76,672	79,465	81,938
NCES	66,310	67,940	72,050	73,980	73,760	74,920	78,970	82,170

As can be seen from both the table and the graph, there is little difference between the three sets of projections. Rarely is the magnitude of difference greater than about 2,000 students, or less than a three percent difference. For that reason, it an error rate of three percent is assumed in these projections as a simple approach to develop upper and lower bounds to the projections.

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Through analysis of the most recent four years of Part C of the IPEDS Fall Enrollment Survey, Geographic Origin of First-time, Full-time Freshmen, it is determined that, on average, 63% of recent Virginia high school graduates are enrolled as first-time, full-time

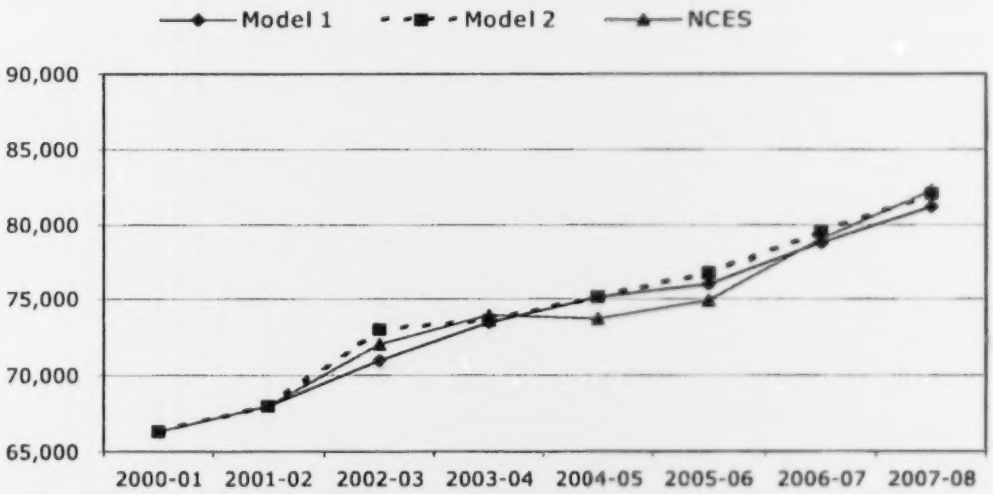

Figure 10: Comparison of three projections of high school graduates.

freshmen in colleges and universities nationwide. Of these, 72% typically attend a Virginia institution. Through analysis of first-time freshmen data in SCHEV's data warehouse, it is determined that, on average, 61% of these students will attend public four-year institutions, 24% public will attend two-year institutions, and 15% will attend private institutions. The table below breaks the projected number of graduates into these categories using an average of the three projections with 1.4% upper and lower bounds (one standard deviation of the projections with the greatest variances).

These numbers represent a very narrow, albeit traditional, sort of student demand, or rather the magnitude of expected demand pressure. At their very core they are no more than the typical distributions of past student enrollments applied to the numbers of projected high school graduates. However, these distributions do provide a roadmap on which to plan enrollment targets in collaboration with the state's colleges and universities. Perhaps more importantly, the projections of high school graduates reinforce and support the 2003 demand projection of in-state undergraduates as the incremental changes by year are easily a significant portion of the incremental changes in the demand model.

	Projected High School Graduates					
	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08
Mean	**72,000**	**73,683**	**74,686**	**75,859**	**79,063**	**81,771**
UPPER	73,008	74,714	75,732	76,921	80,169	82,916
LOWER	70,992	72,651	73,640	74,797	77,956	80,626
Graduates likely to attend college anywhere in the US						
UPPER	45,964	47,038	47,678	48,427	50,472	52,201
LOWER	44,695	45,739	46,362	47,090	49,079	50,760
Graduates likely to attend college in Virginia						
UPPER	33,094	33,867	34,329	34,868	36,340	37,585
LOWER	32,180	32,932	33,381	33,905	35,337	36,547
Graduates likely to attend college in Virginia at public four-year institutions						
UPPER	20,187	20,659	20,940	21,269	22,167	22,927
LOWER	19,630	20,089	20,362	20,682	21,555	22,294
Graduates likely to attend college in Virginia at public two-year institutions						
UPPER	7,943	8,128	8,239	8,368	8,722	9,020
LOWER	7,723	7,904	8,011	8,137	8,481	8,771
Graduates likely to attend college in Virginia at private institutions						
UPPER	4,964	5,080	5,149	5,230	5,451	5,638
LOWER	4,827	4,940	5,007	5,086	5,300	5,482

Transfer demand

SCHEV staff followed several approaches to attempt to forecast demand for public four-year institutions by potential transfer students from the VCCS and Richard Bland College. Unfortunately, there are not adequate data to create a model to project transfers, and this is mostly due to the behavior of the four-year institutions in admitting and enrolling such students. Data suggest that supply appears to be well below demand and that there is no true measure of demand at this point. However, the VCCS has informed SCHEV that it expects enrollment increases to lead to an additional 3,000 entering VCCS students expecting to transfer to a public four-year institution by the end of the decade.

Systemic & Institutional Analysis

Systemwide Projection of Institutional Seats

The instructions provided to the institutions for the development of institutional targets included the following language:

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As you respond to the following questions, you should assume a "worst-case" scenario and consider the following assumptions:

- *Minimal additional general fund resources for enrollment growth*
- *Minimal additional general fund resources for student financial aid*
- *Minimal additional general fund resources for support of new facilities*
- *GOB facilities being built over the next seven years (rather than next two)*

The result is a forecast of the number of institutional seats the institutions are willing to fill under the above scenarios and assumptions thus producing institutional enrollment "targets." By and large the result is rather flat, at least in terms of the new students to be enrolled. Overall, the institutions are planning to increase enrollment by nearly 7,000 full-time equivalent students (FTE) in 2007-08 as compared to 2002-03. This corresponds to net growth in fall headcount (actual students) of approximately 8,500 students in fall, 2007 over 2002. On the face, this growth seems contrary to a "worst-case" scenario or "flat" enrollment forecasts. Actually, it is not, as it represents the improved (read: increased) retention and graduation rates of Virginia's colleges and universities. With only modest, very modest, improvements in retention at all levels, enrollment totals at Virginia's colleges and universities are likely to increase.

One might ask, after looking at the past and previous sets of enrollment targets compared to actual enrollments, how accurate these institutional targets are? The graph below demonstrates that actual enrollment has been significantly greater than the institutional enrollment targets as well as the original SCHEV demand projections from 2001. However, through working with the institutions to simplify and "open-up" the forecasting process and then doing a system-wide validation test of the total forecasts, we find these projections are well-grounded in reality and represent the institutions' best understanding of their particular markets.

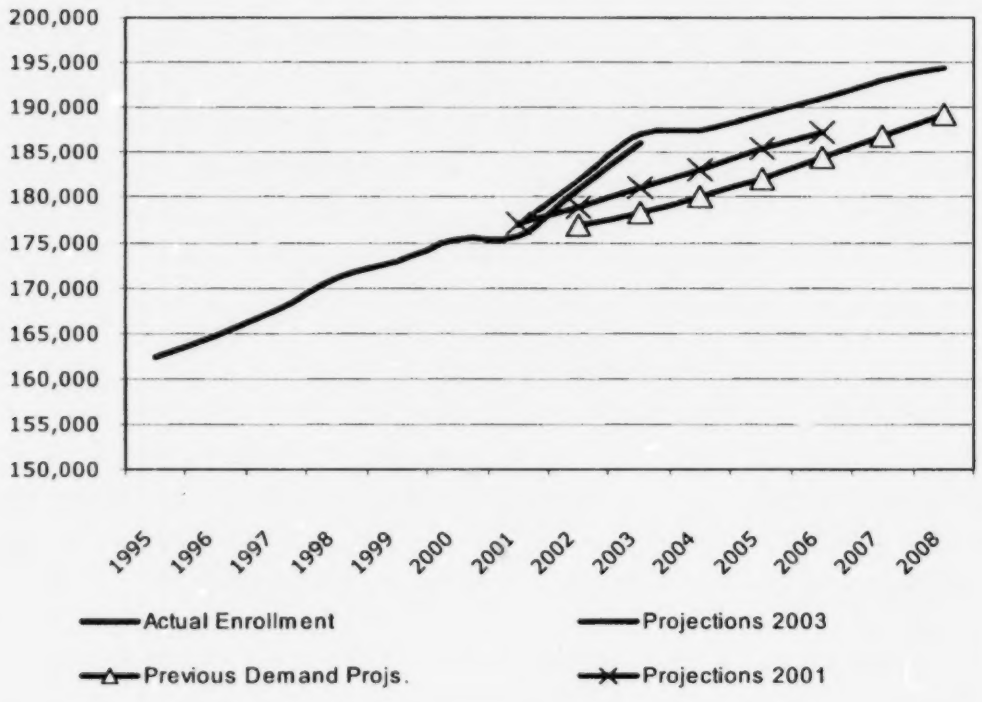

Figure 11: Comparison of various SCHEV Projections.

The systemwide validation performed was based on complex projection model using the institutional forecasts in concert with SCHEV's student-specific data warehouse to measure student retention at the system level. This model relies on a variety of components to develop a reasonable map of student enrollment. First, it uses the institutional targets for new student enrollments for freshmen, transfers, graduate and first professional students. These totals are then added to the projected number of continuing students based on patterns of fall-to-fall retention, spring-to-fall retention (including projections of new spring students), average numbers of re-admitted students, as well as new unclassified students (at all levels). The final group added is the most problematic, and that is the group of students that "swirl" or "churn" throughout the system. These are students that may arrive in the spring as new students, stop-out the following fall, and show up again the following spring. They might also enroll in the fall the first-time, attend or not the following spring, skip the next fall, and then enroll again the following spring. Because of their erratic attendance, they tend to drop out of all but the most complex retention models. Fortunately, these students only usually account for between a few

hundred and two thousand students per year, but they do add a significant amount of statistical noise to the system.

Ultimately, this model results in forecast that is very similar to the total of the institutional forecasts of their enrollment targets with little difference in the out years, assuming the most recent systemwide retention rate is held constant. If it is assumed that retention will continue to increase, even just very slightly, the differences are more pronounced. The reverse is also true if retention rates were to decrease for some reason. Nonetheless, this

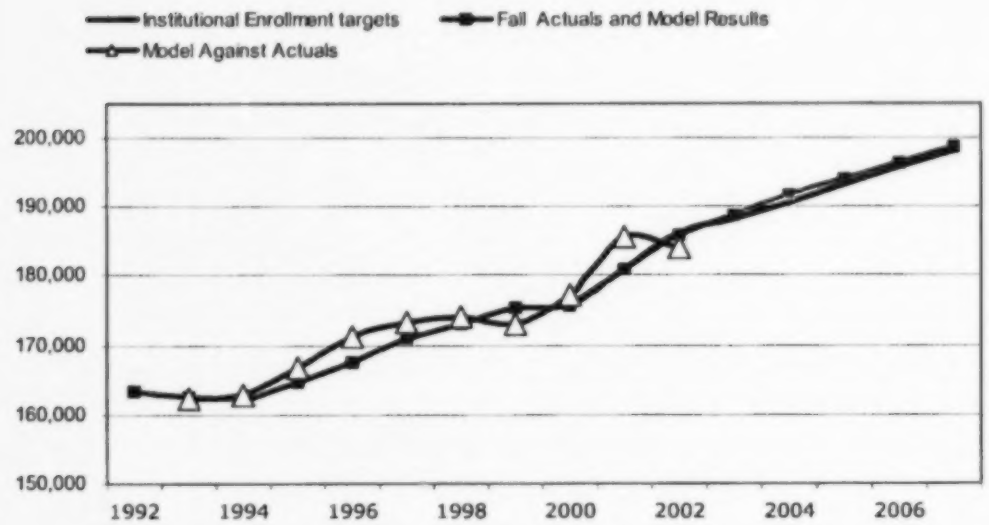

Figure 12: SCHEV Enrollment validation model compared to institutional enrollments and targets.

analysis suggests that the individual institutions have taken a reasoned and informed approach to preparing their enrollment targets.

The line depicted with triangles at the data points represents the performance of the model against actual enrollments for earlier years. It is not a perfect model by any means, but the differences are somewhat exaggerated as the Y-axis only represents one-quarter to one-third of the magnitude of the enrollment totals displayed. The actual difference between actual enrollments and projected is never greater than 2.6%.

Once again, this suggests that the forecasts developed by the institutions, when viewed in the aggregate, seem to make sense and are consistent with past trends. While it might be suggested the same approach be applied to the each set of institutional enrollment targets, the range of variable factors prevent any type of meaningful analysis. For instance

one could assume that a consistent percentage of Virginia high school graduates would attend a given institution, but that would require assuming that institutional admission policies are unchanging year to year, which may not be reasonable if institutions continue to compete for the best students, or at least similar students. All in all, the retention-based model closely matches what the institutions have forecasted for themselves.

Freshmen

Virginia's four-year colleges and Richard Bland College, as a group, are still planning increases in the size of their entering freshmen class, both for in-state and out-of-state students. These planned increases are modest and represent what the institutions feel they can do with their current levels of resources. Also, as mentioned earlier, these numbers do not just represent recent high school graduates, but they also represent older students as well.

Enrollment Targets, Public Four-Years and Richard Bland College
Fall, First-time Freshman Enrollment

	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	Total % Change
Resident	20,549	21,179	21,247	21,600	21,609	21,713	5.7%
Non-Resident	6,578	7,078	6,917	6,998	7,034	7,118	5.1%
Total	27,757	28,319	28,517	28,639	28,643	28,831	5.5%

When the enrollment targets for first-time, Virginia resident freshmen, are compared to SCHEV's projections of projected high school graduates likely to attend a four-year public institution, after removing the targets for Richard Bland College, we observe a potential problem – institutional targets for first-time freshmen from Virginia are significantly less than even the lower bound of the projections for high school graduates. The difference is even greater than readily apparent when one realizes that typically 600-800 first-time freshmen each year are not recent high school graduates from the previous year. Therefore, the gap appears to be at its worst in 2007-08 when there are possibly 1,600 to 2,400 fewer seats available than there is demand.

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Enrollment Targets, Public Four-Year Institutions
Fall, First-time Freshman Enrollment

	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	Total % Change
Resident	20,196	20,826	20,894	21,247	21,256	21,360	5.7%
Non-Resident	6,571	7,078	6,910	6,991	7,027	7,111	5.1%
Total	27,324	27,757	28,290	28,549	28,686	28,711	5.5%
Projected HS Graduates likely to attend college in Virginia at public four-year institutions							
Upper Bound	20,187	20,659	20,940	21,269	22,167	22,927	
Lower Bound	19,630	20,089	20,362	20,682	21,555	22,294	

However, another set of projections, these done by the Voorhees Group out of Littleton, Colorado, suggests the number might be quite a bit smaller in terms of demand -19,509 in Fall 2006 and 19,572 in Fall 2008. This model relies on a different set of demographic Census data and is run at the locality level. Predictor variables in the model include Median Housing Value, Unemployment Rate, Median Household Income, Poverty Rate, Percent of Population with only High School Education, Percent of Population with Baccalaureate or Higher Education, and Percent of Population Migrated from Out of State. Distributions of college-level participation are drawn from the SCHEV Data Warehouse E-12 Report "New Undergraduate Enrollment by Domicile." While a substantially different approach then the other projections referenced in this report, and likely much more conservative, it suggests there may be an upper limit to recent high school graduate demand for public, four-year enrollment based on relative wealth. This may be especially true given the current increases in tuition.

If this more conservative set of projections is indeed accurate, then it suggests the public four-year institutions may have greater capacity than forecast because even more recent high school graduates will choose to attend the VCCS to buy down the first two years of college simply on a cost of attendance decision with plans to transfer later. Not only would this add increased pressure to the VCCS, but it would also serve to make transfer to a four-year college more competitive than it already is. Another implication of this projection is that if financial aid were to be increased to a level sufficient for the less wealthy students to attend, it would have to be maintained at similar levels through their attendance in order to keep them enrolled. Finally, it does suggest the need for a study of tuition elasticity in the public sector in order to have a greater understanding of the relationship between access and demand.

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Transfer Students

Since 1992, the number of entering Virginia-resident fall transfer students has declined from 8,409 to 8,023 in Fall, 2002 after reaching a low of 7,407 in 2000. The public four-year institutions have planned to increase the size of their in-state transfer classes by 9% over the next five years. Of these students, only about 1,500 each year are associate degree-qualified graduates from the VCCS. Throughout the institutional enrollment meetings, it was a recurring theme that the four-year institutions preferred to accept transfer students holding an associate's degree. Further, it was pointed out in the meeting with the VCCS, that as a matter of public policy, it was far better for students to transfer with an associate's degree because if they weren't successful at the baccalaureate level they were better off with the associate's degree as opposed to just 'some college' or a "bag of credits," as recent studies evaluating the relationship between income and educational attainment have shown.

Enrollment Targets, Public Four-Years Institutions
Fall, New Transfer Student Enrollment

	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	Total % Change
Resident	8,238	8,332	8,476	8,559	8,598	8,652	9%
Non-Resident	1,411	1,383	1,414	1,443	1,467	1,499	10%
Total	**9,649**	**9,715**	**9,887**	**10,002**	**10,065**	**10,151**	**9%**

The reader should be cautioned that the above table represents all students considered to be transfers. Unlike the tables in the recent SCHEV Report "The Condition of Transfer in the Commonwealth," these figures do not represent just students without gap in enrollment between institution, instead they represent students entering as new students that have an undergraduate enrollment history somewhere in their past – as little as a matter of weeks to many years. Analysis shows that in any given year, typically 80-100% of associate degree qualified transfers from the VCCS have completed their associate's degree within the last two years. Also of note is the fact that of non-resident transfers, fewer than 30 students annually have earned a two-year degree from the VCCS prior to transfer.

Graduate Students

The public four-year institutions are planning an increased enrollment of 23% of new graduate students, from both in state and out-of-state. While this is a substantial increase,

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and the largest level increase in the institutional targets, many graduate programs are the most flexible in terms of space needs, scheduling, location, and often the lack need for specialized equipment or other fixed assets that an engineering or biotechnology program must have to provide the necessary student experience.

Enrollment Targets, Public Four-Years and Richard Bland College
Fall, New Graduate Student Enrollment

	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	Total % Change
Resident	6,547	6,651	6,880	7,131	7,323	7,437	23.1%
Non-Resident	3,615	3,679	3,894	4,125	4,334	4,513	23.2%
Total	**10,162**	**10,330**	**10,774**	**11,256**	**11,657**	**11,950**	**23.0%**

First Professional Students

First professional programs include law, medicine, veterinary science, dentistry, and pharmacy. Based on the institutional targets, there is very minor growth planned for first professional programs. As described earlier, they are the least flexible of academic programs in terms of size.

Enrollment Targets, Public Four-Year Institutions
Fall, New First Professional Student Enrollment

	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	Total % Change
Resident	857	878	874	874	874	874	1.7%
Non-Resident	590	564	562	562	562	562	1.5%
Total	**1,447**	**1,442**	**1,436**	**1,436**	**1,436**	**1,436**	**1.6%**

Overall Enrollment Targets: Public four-year institutions

As can be seen in the tables below, and consistent with the patterns in the previous section of enrollment targets for first-time students, moderate growth in total enrollments is planned by the four-year institutions under the beginning assumptions of minimal funding. Including off-campus enrollment, which counts only students who have no enrollments at all on the main campus, very little growth intended. Only 268 (1.5%) additional students are targeted by Fall 2007 in off-campus enrollments.

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Enrollment Targets, Public Four-Year Institutions
Fall On-Campus Headcount Enrollments

	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	Total % Change
Undergrad	133,559	134,474	135,538	136,497	137,586	138,290	3.5%
First Professional	4,781	4,794	4,779	4,777	4,776	4,775	0.0%
Graduate	29,830	30,291	30,922	31,606	32,399	33,138	11.1%
Total	**168,170**	**169,559**	**171,239**	**172,880**	**174,761**	**176,203**	**4.8%**

Fall Off-Campus Headcount Enrollments

	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	Total % Change
Undergrad	4,925	4,946	4,947	4,948	4,948	4,949	0.5%
First Professional	-	-	-	-	-	-	-
Graduate	12,903	12,818	12,908	12,999	13,074	13,147	1.9%
Total	**17,828**	**17,764**	**17,855**	**17,947**	**18,022**	**18,096**	**1.5%**

On-campus enrollment targets are projected to grow a total of 8,033 students (a 4.8% increase), with 4,731 of that in undergraduates and 3,308 in graduate students. First professional student enrollment targets are actually projected to be six fewer in Fall 2007. Most of the growth in undergraduate students can be attributed to increases in enrollment of new freshmen (both in-state and out-of-state) and increased enrollment. In point of fact, the overall growth can be readily attributed to the substantial growth that has already occurred, specifically in the years 2000-2002 and the affects of the students admitted then still being retained in the system, while new admits are not reduced, but either held flat or increased slightly.

Enrollment Targets, Public Four-Year Institutions
Fall On- and Off-Campus Headcount Enrollments

	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	Total % Change
Undergrad	138,484	139,420	140,485	141,445	142,534	143,239	3.4%
First Professional	4,781	4,794	4,779	4,777	4,776	4,775	0.0%
Graduate	42,733	43,109	43,830	44,605	45,473	46,285	8.3%
Total	**185,998**	**187,323**	**189,094**	**190,827**	**192,783**	**194,299**	**4.5%**

Enrollments described as Annual Full-time Equivalent (FTE) are calculated based on the number of credit hours during the year that student takes. Using this measure, one can make two conclusions: 1) total headcount and FTE growth are nearly identical at about four percent; and 2) institutions are planning to increase out-of-state enrollments more than in-state enrollments in terms of percentages (3.5% instate vs. 6.5% out of state.

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Enrollment Targets, Public Four-Years and Richard Bland College
Annual FTE

	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	Total % Change
In-State	124,092	124,651	125,723	126,600	127,576	128,495	**3.5%**
Out-of-State	38,812	39,489	39,878	40,373	41,011	41,325	**6.5%**
Total	**162,905**	**164,140**	**165,601**	**166,971**	**168,585**	**169,818**	**4.2%**

The following table demonstrates that the four-year institutions, while planning to grow out-of-state enrollments at a faster rate than in-state enrollments, are still increasing in-state enrollments in higher actual numbers. Since out-of-state students pay significantly more than in-state students, this trend is likely due to fiscal reasons further magnified by recent budget reductions.

Change in Annual FTE 2002-03 to 2007-08, Public Four-Year Institutions

	In-State FTE		Out-of-State Change	
	(n)	(%)	(n)	(%)
Undergraduate	2,953	2.9%	1,415	5.1%
Graduate	1,487	7.8%	1,088	11.1%
First Professional	-35	-1.0%	4	0.3%
Total	**4,403**	**3.5%**	**2,513**	**6.5%**

Overall, the institutional targets contain growth at all levels in the public four-year institutions, of both in-state and out-of-state students. While the targets include growth in the new student populations, it is not at the same level as overall, thus much of this growth represents the effects of students admitted in the last two years (or so) that are still being retained by the institutions and are thus working their way through the pipeline. Some of these students will graduate and then leave the system, while others will graduate and then pursue advanced study within the system. With increased retention and progression rates, which are measures the institutions are held accountable for through the Reports of Institutional Effectiveness, the more we will see student enrollment grow.

Institutional projections/targets summary : Public four-year institutions

The table below provides a summary of the institutional changes in enrollment targets between 2002-03. Greater detail can be found in Appendix B and on SCHEV's website (http://www.schev.edu).

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Enrollment Targets
Fall Headcount/Annual FTE - All Students/All Campuses

	Actual/Estimated		Projected		Percent Change	
	2002-03		2007-08		2002 vs. 2007	
	Headcount Fall 2002	FTE 2002-03	Headcount Fall 2007	FTE 2007-08	Headcount	FTE
CNU	5,391	4,489	5,054	4,434	-6.3%	-1.2%
CWM	7,662	7,658	7,645	7,612	-0.2%	-0.6%
GMU	26,796	20,150	28,567	21,407	6.6%	6.2%
JMU	15,965	15,614	16,960	16,345	6.2%	4.7%
LU	4,178	4,017	4,675	4,454	11.9%	10.9%
MWC	4,735	4,173	4,710	4,155	-0.5%	-0.4%
NSU	6,839	5,320	7,300	5,625	6.7%	5.7%
ODU	20,105	15,149	20,105	15,149	0.0%	0.0%
RU	9,242	8,690	9,352	8,807	1.2%	1.3%
UVA	23,144	22,104	23,505	22,486	1.6%	1.7%
UVA-W	1,632	1,231	1,727	1,312	5.8%	6.6%
VCU	26,009	20,743	28,974	23,358	11.4%	12.6%
VMI	1,299	1,494	1,300	1,535	0.1%	2.7%
VSU	4,974	4,490	5,700	5,070	14.6%	12.9%
VT	28,027	27,582	28,724	28,069	2.5%	1.8%
Subtotal	185,998	162,903	194,298	169,818	4.5%	4.2%
RBC	1,058	944	1,305	958	23.3%	1.5%
Total	187,056	163,847	195,603	170,776	4.6%	4.2%

Three institutions have targeted decreases in enrollment: Christopher Newport University, the College of William and Mary, and Mary Washington College. Changes at both the College of William and Mary and Mary Washington College are really quite insignificant decreases, however Christopher Newport University is projecting a total enrollment of 663 fewer students. This significant decrease is anticipated in part because assumptions that retention rates for freshmen and sophomores in Fall 2003 will decrease due to the closure of three undergraduate academic programs.

Seven institutions have enrollment targets with increases of greater than five percent. These institutions are George Mason University, James Madison University, Longwood University, Virginia Commonwealth University, Virginia State University, UVA-College at Wise, and Richard Bland College. Much of this increase can be attributed to retention of students admitted over the last three years; however, some are intending to continue to increase the size of their freshman classes for in-state students from Fall 2002 levels, namely: Christopher Newport University, George Mason University, Longwood University, Norfolk State University, the University of Virginia, and Virginia Tech.

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Gap Analysis: Supply vs. Demand: Public four –year institutions

Overall, there is a predicted shortage of supply in Virginia public higher education in the Fall 2007. Comparison of the revised Demand Forecast to the sum of the institutional enrollment targets for four-year public institutions indicates a gap of 1,829 in-state students, or 1.2% of enrollment targets in 2007. On the surface this seems perhaps to be of little concern. In fact, such a small difference might be considered to be mere statistical noise. However, when the numbers are disaggregated, there may well be a problem in undergraduate demand. For purposes of the following charts, a positive gap indicates demand in excess of supply, and a negative gap indicates supply in excess of demand. In other words, a positive number indicates supply cannot support the projected demand.

Public Four-year Gap Analysis - All students

	2003-04	2004-05	2005-06	2006-07	2007-08
Revised Demand Forecast	146,984	148,686	150,374	152,055	153,737
Inst. Targets – Classified	130,773	132,122	133,279	134,636	135,801
Inst. Targets – Unclassified	15,885	15,951	15,990	16,038	16,106
Total Inst. Targets	146,658	148,074	149,270	150,675	151,908
Gap	**326**	**612**	**1,104**	**1,380**	**1,829**

Institutional enrollment targets, assuming no additional funding for in-state undergraduate students beyond current levels, leave a projected gap of 2,265 in Fall 2007. By extrapolation, this gap could be as high as 6,300 by 2010. This gap represents two percent of the 2007 enrollment targets and is hidden in the overall totals by the capacity for graduate students in excess of the forecasted demand. This gap becomes even more noteworthy when viewed in the context of the growth in projected high school graduates likely to attend public four-year institutions as making up the bulk of this gap and also in the context of perhaps 3,000 students from the VCCS eventually seeking to transfer. With the addition of these factors, this looks to be much more of a potential problem in demand exceeding supply.

Public Four-year Undergraduate Gap Analysis

	2003-04	2004-05	2005-06	2006-07	2007-08
Revised Demand Forecast	112,009	113,306	114,592	115,873	117,155
Inst. Targets – Classified	106,575	107,435	108,263	109,088	109,789
Inst. Targets – Unclassified	5,131	5,096	5,090	5,088	5,101
Total Inst. Targets	111,706	112,531	113,353	114,176	114,890
Gap	**303**	**775**	**1,239**	**1,697**	**2,265**

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Interestingly, when it comes to in-state graduate enrollments, the public institutions are planning enrollments that exceed the revised forecast of demand by 593 students. Is this problematic or unrealistic? Probably not, as demand model does not take into account any consideration of institutions creating new demand through marketing efforts. Also, economic changes or business interests may have more direct effects on graduate programs, especially at the master's level.

Public Four-year Graduate Gap Analysis

	2003-04	2004-05	2005-06	2006-07	2007-08
Revised Demand Forecast	31,734	32,101	32,466	32,829	33,192
Inst. Targets – Classified	20,949	21,453	21,783	22,315	22,780
Inst. Targets – Unclassified	10,755	10,855	10,900	10,950	11,005
Total Inst. Targets	31,704	32,308	32,683	33,265	33,785
Gap	**30**	**(207)**	**(217)**	**(436)**	**(593)**

There is very little change in the sum of the institutional targets for in-state first professional students. This is due mostly to the nature of these programs and their relatively small size and high cost.

Public Four-year First Professional Gap Analysis

	2003-04	2004-05	2005-06	2006-07	2007-08
Revised Demand Forecast	3,241	3,279	3,316	3,353	3,390
Total Inst. Targets	3,248	3,234	3,233	3,233	3,232
Gap	**(7)**	**45**	**83**	**120**	**158**

Demand and capacity in the Two-year Sector

In materials provided to SCHEV, the Virginia Community College System (VCCS) outlined that its physical capacity to serve students was already stressed. Using 2001-02 regular-session (fall and spring) FTE, the VCCS has an overall space deficit of 416,670 square feet representing a deficit of 8,901 FTE students. Most of this space deficit (78% of the overall shortage) can be attributed to the five campuses of Northern Virginia Community College and two of the four campuses of Tidewater Community College, institutions in high-growth, high demand areas. The new capital projects from the general obligation

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bond will result in an overall space surplus of 278,162 square feet and surplus capacity for 5,401 regular-session FTE students. Using a simple multiplier of 2.2 fall headcount students per regular-session FTE, this suggests that there will room for 11,882 students, of the 31,006 forecast.

However, this new capital only addresses about 40% of the deficit at Northern Virginia Community College and Tidewater Community College, which will still be short of 309,579 square feet with an equivalent capacity deficit of 6,013 FTE students. Clearly, if the projected growth in student demand remains along the I-95/I-64 crescent, then these institutions will continue to be stressed at current levels and beyond.

Admittedly, these are rough estimates of physical capacity and say nothing about teaching and operating capacity of the community colleges (having a faculty member in the classroom). However, since early estimates of base budget adequacy suggest an operating budget shortfall of more than $125 million annually in the community colleges and that the VCCS is spending nearly $1,000 less per student for instruction than it did a decade ago in inflation-adjusted dollars, suggests additional enrollment at the community colleges will stress an already stressed system. When coupled with space deficit issues this will more than certainly compromise quality of instruction.

To this point, little has been said specifically about Richard Bland College. The demand projections do not distinguish between the institution and the VCCS. In addition, the VCCS overwhelms the college by its very size. At best, without significant capital investment and faculty, Richard Bland College estimates that it can add only an additional 300 FTE to its current enrollment.

One major issue of concern is what changes are likely to be caused by such substantial growth in the two-year sector in relation to the four-year sector. The recent SCHEV report "Enrollment Trends at Virginia's Public Colleges and Universities" and material from the VCCS suggest trends may lead to significantly greater demand for transfer to a four-year institution. Some of these trends are mentioned below:

- the number of students equaling one full-time equivalent has been declining in recent years, thus more students are taking greater numbers of credits;
- retention rates have increased for students enrolled in the Fall 2001;
- more students are full-time, up to 31% in 2002 from 27.6% in 1992;

- the average credit load for returning students has increased a full credit hour over the last decade, resulting in approximately a 7,000 FTE increase for Fall 2002;
- the number of traditional-aged students (17-24 years of age) has increased, particularly in programs identified as being transfer-oriented; and
- the percentage of high school graduates enrolling directly into the VCCS has increased from the mid-teens to over 20%.

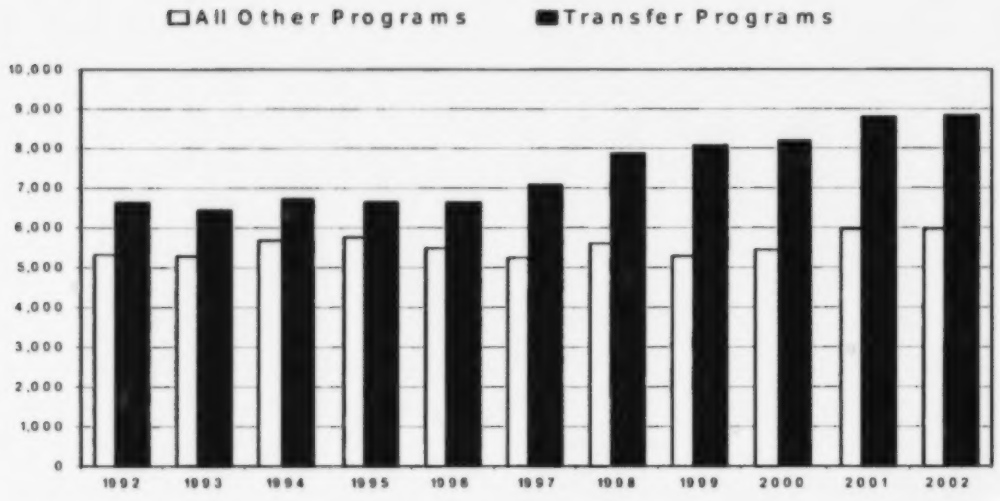

Figure 13: Number of VCCS first-time freshmen Enrolling in Transfer program their first semester.

Figure 13 demonstrates that the number of first-time freshmen enrolling in transfer-oriented programs in their first semester at the VCCS has increased substantially and continually since 1996. Further, the number of full-time, first-time freshmen at the VCCS transferring within three years to a public four-year institution has risen by 15% from 973 (with 1996 cohort) to 1,117 (in the 1999 cohort). Current indications are that this trend will continue – with the caveat that the number of transfer students is limited by the admissions practices of the receiving institutions. Thus, if the public four-year institutions have found it necessary to restrict the numbers of transfer students for budgetary or other reasons, then these trends may seriously understate the demand for transfer by two-year students. Ultimately, this is the difficulty in developing meaningful projections of the likely

number of qualified students seeking transfer from the VCCS to a public four-year institution.

The bottom line for demand in the two-year sector is that there appears to be another 20,000 students on the way. This is especially troubling given that the VCCS is an open enrollment institution and the only way it can really turn students away is by putting caps on individual classes or by pricing itself out of certain markets. While this may limit the impact of demand far in excess of supply, it also may cause students to simply select other course offerings so they can maintain enrollment, thus extending the time it takes to complete a given program. This could also have the effect of exacerbating problems with transfers in that these students may end up taking classes clearly irrelevant to transfer to a four-year institution. At some point, the Commonwealth and the VCCS will likely have to address the real costs associated with this phenomenon. Further, significantly increased and increasing enrollments in the VCCS by more traditional students likely to seek transfer will likely pose a demand problem in the coming years for the public four-year institutions. What is now a stress for the two-year system can easily, and will likely, add stress on the four-year system as well.

Demand and capacity in the Private Non-profit Sector

Despite the obligation of Tuition Assistance Grant-eligible institutions to comply with annual data submission requirements, only 70-80% of institutions regularly provide all data in any given year. Too often this results in an underestimate of enrollments in this sector. This may explain why the new forecast is significantly less than the 2001 projections. However, it may also be much more a question of actual demand and market forces given the real and perceived differences in cost between public and private institutions. Certainly, SCHEV's forecast of high school graduates indicates there may be as many as 700 more Virginia students seeking enrollment in the private nonprofit sector in Fall 2007 as compared to the SCHEV's Revised 2003 demand forecast of 156. It also may be the simple case that the numbers are too small to be that precise as a statistical matter.

In preparation for this report, SCHEV surveyed the institutions, with reminders from the Council of Independent Colleges of Virginia staff. At this writing we have received 20 responses indicating that there is ample capacity in these institutions, now and in Fall 2007. The results of this survey may be seen in Figure 14. Essentially, in Fall 2003 there is forecast surplus capacity of 5,148 enrollments and in Fall 2007, a surplus of 3,746.

What is happening here is that overall capacity for these institutions is remaining basically consistent (from 42,198 to 43,203) while projected enrollments are expected to increase, thus the overall surplus decreases.

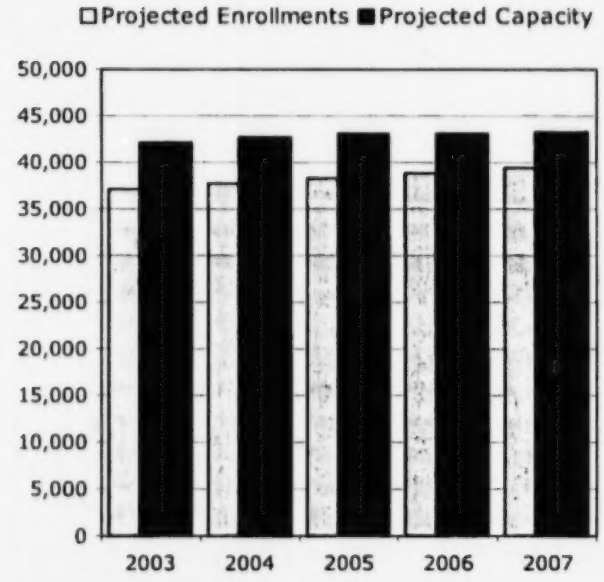

Figure 14: Capacity in the Private, nonprofit sector.

Of these total enrollments, these institutions report there will be approximately 2,972 to 3,224 slots available annually to transfer students. This alone could conceivably be sufficient capacity to address additional transfer demand from the VCCS. That is, assuming students could be induced to attending a higher-priced private institution – even if the actual cost of attendance (through federal, state, and institutional grants) may actually be roughly equivalent to that of a public four-year institution.

Policy Options and Implications

SCHEV is currently contemplating several options for meeting excess demand. Its options range from full funding of the base adequacy model (an enrollment-driven funding model, which encourages increased enrollment) to less costly options such as enrollment agreements, contracts, and/or grants, among other strategies. The following is a listing of some of the options currently under discussion by the Council, many of which were raised during the institutional enrollment meetings with the public and private colleges and universities.

- **Funding Enrollment Growth**
  - Funding for growth under base adequacy guidelines. Using numbers from 2001-02 (2002-03 numbers will not be available until September 2003), funding just the growth forecast in 2010 would cost roughly $125 million dollars. SCHEV's current estimate is that the public institutions are funded approximately $350 million below SCHEV's guidelines for

adequate funding. This severely impacts institutional ability to build/maintain quality programs and accept additional growth.

- Additional full-time faculty. A common theme heard throughout the institutional meetings was the lack of faculty. The majority of institutions, when asked about creative use of the day to create greater efficiencies in space utilization and student throughput, responded that the number of available faculty was simply inadequate to make significant changes without substantial increases in faculty teaching loads. Faculty are ultimately what make the institution not only successful, but marketable, to students because they define the institutions' ability to not only deliver courses, but to deliver them in sequence and on time to allow for graduation in four years. Adequate numbers of faculty will be perhaps the most critical factor in the ability of institutions to accept more students. Adjunct faculty may play a critical role in meeting the need for faculty, but sufficient quantity and quality of adjunct faculty simply may not be available in some regions, particularly for institutions such as Longwood University and the University of Virginia's College at Wise.

- **Better use of the senior year**

  - Early college. Richard Bland College is working to consolidate its high school dual enrollment into a satellite campus. This model could be used in a variety of ways to better prepare students for the baccalaureate experience while perhaps providing a leg-up for early graduation.

  - HS dual enrollments and/or Advanced Placement. Dual enrollment programs are being used across the Commonwealth to varying degrees of accessibility and success. Greater dual enrollment would not only produce students better prepared for college study, but possibly students more likely to graduate on time or early because of their ability to accumulate transferable college credit. Even if the tendency is for students, despite the number of college credits at HS graduation, to stay in college four-years for student life reasons, there may be opportunities to package a baccalaureate and masters degree in four years, especially in the areas of teaching. However, greater dual enrollment through the VCCS (and other institutions for that matter) will put additional stress on existing faculty even if they are only coordinating the dual enrollment programs and evaluating syllabi.

- **Improve transferability from two-year to four-year colleges**

    - Transfer preference given to AA graduates. All colleges indicated a preference for degree-qualified (AA graduates) transfer students. It also appears to be in the best interest of two-year students to be pushed towards completing the AA as they are then better served if they do not transfer, or do not finish a four-year program since possession of an associate's degree will likely lead to higher income than just "some college."

    - Transfer grants or vouchers. State vouchers or gift-aid to qualified to students to make transferring to a four-year institution (public or private) more affordable. Such a program might allow the Commonwealth to more effectively leverage the VCCS for rising high school students. This would have the added benefit of making a four-year degree more affordable to many students who could complete their first two years at the VCCS at a much lower tuition cost than at a four-year institution and then when tied to a transfer grant, make it more affordable still. At a time when the state is grappling with serious resource issues, this becomes a powerful tool for ensuring access to higher education for its poorest citizens. However, it should be recognized that it would be difficult and unfair to provide such funding only to "new" transfer students and thus budgeting for such a program would require including funds for existing numbers of transfer students.

    - Transfer coordinator positions placed at VCCS institutions. Clearly, based on institutional experiences, transfer from the VCCS to four-year institutions is made easier and more effective through the use of transfer advisors located in each of the community colleges. Anecdotally we have heard that good advising is critical to successful transfer and thus funding and creating these positions would go a long way towards ensuring that students entering a VCCS college intending to transfer to a four-year institution later would be well-prepared to do so.

    - Transfer scholarships. High-achieving transfer students could be awarded scholarships to support their studies at four-year institutions, contributing towards stronger retention and graduation rates of transfer students. This would have the added benefit of not only recognizing

academic excellence, but also of making those students much more desirable to the state's flagship institutions.

- Transfer scholarships for high demand fields such as Teacher Education, Nursing, etc. Scholarships could be targeted for qualified students interested in pursuing studies in fields where there is high demand.

- **Student voucher variations**. During both formal and informal discussions, SCHEV staff members have explored a number of voucher options that would either provide for a more market-based approach or perhaps make certain groups of students of more interest to institutions in order to increase enrollments beyond current targets.

- **Differential tuition pricing**

  - Premium charged on professional and graduate programs. Programs with high student-demand, particularly those with high likelihood of high pay for their graduates, could charge a premium above tuition to increase revenue for the institution and to support those programs more explicitly. This would be especially beneficial to high-cost graduate and professional programs. This approach can also be applied to undergraduate programs in order to lower tuition in high-need majors (teaching, nursing) to attract greater numbers of qualified students.

  - Reduced tuition for off-hours courses. This form of tuition differential could be used to encourage student enrollment in course offerings in late afternoons, early evenings or weekends to improve space utilization. However, it presupposes that faculty is available to teach such classes.

- **Differential funding for growth beyond current enrollments**. Even though institutions are not currently funded at Base Adequacy guidelines for current enrollment, funding at this level for marginal growth might be possible. Increased funding for marginal growth at different steps might be a promising alternative. For example, there might be one level of additional funding for up to 1,000 additional students, and a higher level of additional funding for students above that mark.

- **Market-rate tuitions with student vouchers**. Similar to proposals being debated in other states, some institutions might be allowed to set tuition at market

rates with vouchers attached to in-state students to bring the student's cost more in line with current in-state rates.

- **Continued deregulation/decentralization**. While the institutions feel SCHEV has made substantial gains in this area, they feel that there is still plenty of work to do to streamline bureaucratic processes and reporting. Changes accomplished here would likely cost the Commonwealth nothing and provide the institutions direct savings to apply to other operations.

- **Tuition freedom/flexibility (potentially tied to base adequacy guidelines** (e.g. SCHEV proposal to money committee staffs during 2003 session). Essentially this proposal would allow institutions to generate a level of funding equivalent to Base Adequacy guidelines through tuition revenue instead of direct support from state appropriation.

- **Conscious movement to high tuition/high aid policies**. Virginia has informally had such policies in place. It may be time to formalize these policies and fund financial aid at a level appropriate to the tuition levels the institutions will need to charge to meet their needs for operation.

- **Better utilize technology in delivery of instruction**

    - TeleTechnet Expansion. ODU's TeleTechnet has a presence at all community colleges in the state. It has been shown to be relatively effective and a desirable approach for some students. Expansion could accommodate the needs of additional Virginians.

    - e-Dominion University. A proposal from ODU to create a virtual institution through course delivery targeted specifically to undergraduates in their third and fourth years (transfer eligible students, VCCS graduates).

    - A virtual university. Either as proposed by SCHEV two years ago, or some other model, a virtual university would promise greater student throughput without the investment in bricks and mortar. Conceivably a virtual university could also increase enrollment across the state while relying almost entirely on existing course preparations delivered in both traditional and non-traditional formats.

- Incorporate a technology requirement for space utilization (e.g. x% of courses taught on-line). This proposal would be relatively simple and inexpensive to implement, as it is a change in reporting of activity and would encourage institutions to change their offerings without forcing them to do so.

- **Decrease time to degree**

  - Summer semester as trimester. This is another proposal from ODU that would improve the throughput of students through the institution. Summer course offerings throughout the Commonwealth are rather minimal. By changing this, based on current metrics of course demand from existing students, institutions could improve the completion rates of students by making desired courses available during the summer. However, this will not work for institutions where the bulk of the student body wishes to leave campus during the summer. Could also be used to provide a Baccalaureate and Masters degree in five-years if packaged in such a way (e.g. teaching, nursing).

  - Rebates for 3-year completers. Many students are capable of completing a four-year degree in three years through credit from HS Dual Enrollment, AP Credit, and summer enrollment. Through inducements, such as rebates, more students might be encouraged to graduate early, thus freeing seats for new students.

  - Credit hour limits for in-state subsidy. Each year, approximately 18% of graduates in four-year baccalaureate degree programs at a single institution of study graduate with an excess of 135 earned credits. Through elimination or reduction of the state subsidy on study exceeding 135 credits (equivalent to one-semester past the four-year full-time mark) ,a potential statewide savings of more than four million dollars could be generated.

  - Better space utilization (weekends, afternoons, trimesters, longer day). A number of institutions believe that they are at the limits of physical capacity and thus cannot accept additional students; however, their classroom utilization patterns are very traditional with the bulk of usage occurring between the hours of 9:00 am and 2:00 pm. Through scheduling, incentives, differential pricing, and other alternatives,

institutions could find ways to increase the use of their physical facilities to increase enrollment or student throughput. However, this option does presuppose there are adequate numbers of faculty to increase utilization.

- **Private College capacity**

  - Transfer grants. At a recent meeting of the Private College Advisory Board, SCHEV staff members were informed that there is existing capacity in the private institutions in the third and fourth year and that many of these institutions would be interested in pursuing more formal articulation and transfer agreements, especially if additional funding would be made available to transfer students to encourage them to consider private institutions and see them as affordable options. Clearly, with some 3,000 spaces available for transfer students, this is could be a very desirable partnership to consider.

  - Increase Tuition Assistance Grants. Virginia has a strong collection of private colleges that could be used to handle enrollment growth. However, sticker shock and real differences between public and private tuition often discourage students and their families from considering private higher education. Therefore, increasing the TAG grant substantially, perhaps even to the equivalent of the average state subsidy at public institutions, might encourage higher enrollments at the private institutions.

Conclusions

As usual protocol dictates, SCHEV engaged in a revision of its biennial enrollment projections/targets for the public four-year institutions and Richard Bland College and a revision of its 2001 demand forecast. Chmura Economics & Analytics completed the demand analysis under contract with SCHEV with some tweaking of the original model. The new demand forecast, being significantly higher than the 2001 forecast and higher than the institutional enrollment targets and/or capacity available, indicates there will likely

be gaps in service. At the four-year institutions, this shortfall is primarily among in-state undergraduates and represents a likely gap of 2,265 students in Fall 2007 and perhaps as many as 6,200 by Fall 2010 thus as much as half of the projected in-state undergraduate growth may not be served by the end of the decade. In the already over-stressed public two-year sector there appears to be the makings of a significant enrollment problem where another 20,000 students are projected by 2010. The two-year sector is already substantially under funded and even with new capital projects in the construction pipeline, is working at a significant space deficit. The space deficit is most acute at Northern Virginia Community College and Tidewater Community College where much of the growth is likely to occur. Institutional projections indicate that there appears to be insufficient space for transfer students. Further, if enrollment continues to grow at the VCCS in the same manner it has in the past, with more traditionally-aged and more transfer-oriented students, then this enrollment problem will begin to show up in the four-year sector, exacerbating the need for in-state undergraduate capacity. The demand forecast for private institutions is flat and there appears to be capacity for growth in that sector. Finally, with additional resources, many of the public institutions are willing to grow.

SCHEV is considering a number of potential solutions; there are a variety of options to pursue. With the possible exception of full funding under the base adequacy guidelines, none of the options listed are silver bullets that will alone solve all the enrollment gaps. Marginal funding of the projected growth alone under base adequacy guidelines could cost approximately $125 million dollars annually. Instead, multiple solutions will need to be used in order to develop a solution package affordable to the Commonwealth that meets the needs of access to higher education for Virginia's citizens. It is to this goal that SCHEV is committed.

Acknowledgements

Like all of SCHEV's reports, this is a collaborative effort. Special thanks go to the ad hoc members of the ad hoc enrollment projections steering committee: Tony Maggio, House Appropriations Committee staff; Michael Maul, Department of Planning and Budget; Amy Sebring, Senate Finance Committee staff; Peter Blake, Deputy Secretary of Education; Larry Getzler, Department of Planning and Budget; and Tod Massa and Phyllis Palmiero of SCHEV. Tod Massa authored the report, with direction from Phyllis Palmiero and assistance from Chuck Steenburgh and Dan Hix.

Appendix A

Report by Chmura Economics & Analytics contracted by SCHEV.

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